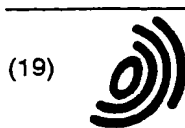


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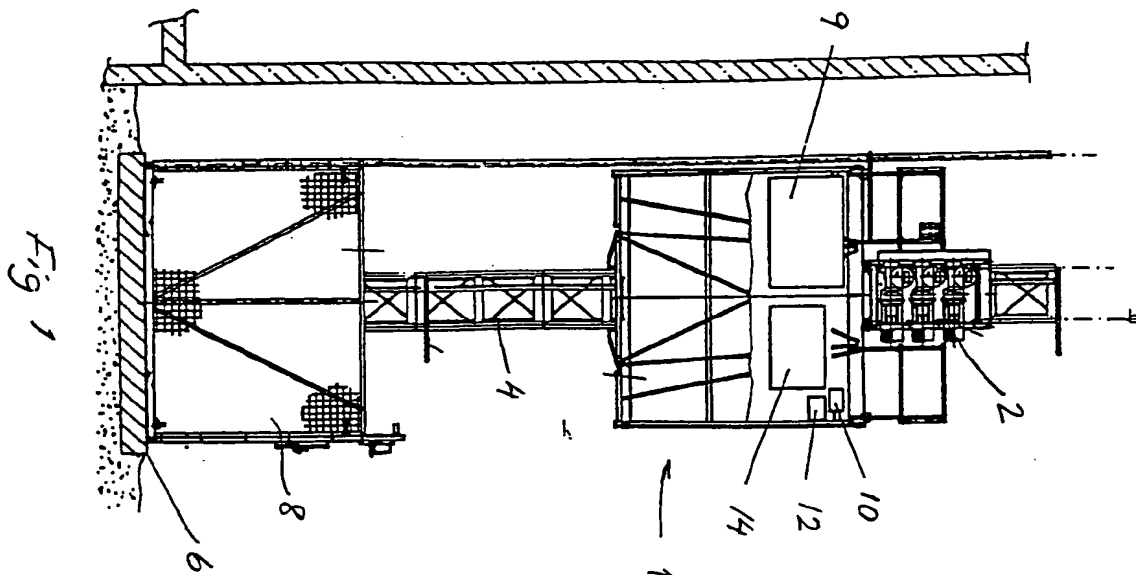
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(54) **A time recording system for a hoist**

(57) A passenger hoist or lift, in particular a temporarily erected building hoist, comprises a hoist cage (1) having a control system for the control of the hoist. The hoist has locking means (10), which in a locking position prevents the utilization of the hoist and in a release position permits the utilization thereof. An identifying system is associated with the locking means (10) for identifying the authorization of a user, whereby a release signal is delivered to the locking means in case of verified accepted authorization. A recording system having a memory unit and a timer is associated with the identifying system, the identity of the utilizer and the time of use being recorded in the memory unit at each occasion of use in order to accomplish a debiting based on time of use.



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## Description

The invention relates to a time recording system for a hoist intended for the carriage of passengers, in particular for a temporarily erected hoist to be used at building sites to transport people to and from their respective work places in a building in course of construction, but it is also suitable for permanently installed hoists, such as service lifts, as well.

At building sites of average to big size there are generally different kinds of lifting machinery, such as material hoists, cranes and similar, to convey the construction material and the employees to desired levels in the building, which substantially contributes to reducing the production times and thus the cost for the present building. But many building sites lack such passenger hoists, especially those, which do not have a main contractor but many different contractors, a most common case in many countries. While the material transports proceed without substantial friction, the employees have to get to their respective work places via ladders and possibly unfinished stairs etc.. These conditions involves not only a considerably increased risk of accident for the employees but also an unnecessary waste of time, which increases the time consumption and impairs the productivity for the construction.

The reason for this present state is that the price of a passenger hoist is substantially higher than that of a hoist for material transports only, so therefore one single contractor alone does not have the capability of carrying the cost for his relatively few personal transports. With existing technology there is no possibility to provide a pay system to an acceptable cost, which would permit other people to use the hoist on payment of a reasonable sum. For in this connection there is no system that provides for a "fair" apportionment of the cost in accordance with the extent, to which the respective groups of employees use the hoist.

The object of the invention is to provide a hoist or lift system, which only could be utilized by authorized persons and wherein the cost for the utilization of the hoist may be apportioned in relation to the time of use of the passenger hoist by respective user or users belonging to a certain group or a certain contractor.

In accordance with the invention said object is attained in a passenger hoist or lift, in particular a temporarily erected building hoist, which comprises the features as defined in the characterizing part of claim 1.

In this manner building hoists for passengers may be utilized at any building site irrespective of type of management without the need, as heretofore, of imposing the total cost for the hoist on a single individual contractor.

By the provision of a passenger hoist a substantial reduction of the total production time is achievable in many building sites in that the time for the transportation of people will greatly be reduced.

Further, it results in the elimination of risks of acci-

dents, since the employees no longer have to use dangerous passages in the construction.

A preferred embodiment of the invention will now be described by way of example with reference to the annexed drawing, wherein:

fig 1 is a view of a building hoist in accordance with the invention, provided with a schematically shown system for identifying and recording of user and of time of use, and

fig 2 is a block diagram of said system.

In fig 1 a temporarily erected hoist system is shown, having a hoist cage 1, driven by a drive unit 2, which in this case is located on the roof of the cage 1 and comprises motors, gears and pinions, which latters engage a straight tooth rack connected to the mast 4 in order to move the cage 1 upwards or downwards along the mast 4 in dependence of the drive direction of the motors. The mast 4 is assembled to a desired level from a number of dismountable lattice sections. Further there are of course a number of different stop levels, of which only the bottom station 8 with entrance level 6 is shown. The features described up to now are all together prior art and constitute a quite typical technology, as regards hoists for the carriage of persons at building sites. In the hoist cage 1 there is also of course a hoist control board 9 to command the hoist cage 1 to go to a desired destination.

According to the invention, the hoist is provided with a system for identifying and recording a user of the hoist and his time of utilization of the hoist. The system is designed so as to allow authorized persons to use the hoist, but to refuse unauthorized persons to do so.

A schematic block diagram of such an identification and recording system is shown in fig 2.

It includes an identification code reader 12. The identification code carrier could be any known type of carrier, but conveniently it is a common magnetic card, the reader then being a slot reader. Preferably, plural code readers 12 are provided in the hoist cage, as a suggestion one at each hoist cage door. Each reader is via an interface connected to a control unit 14, which comprises means for comparing a currently read code with allowed codes previously stored in the control unit 14. If the read code corresponds with one of the allowed codes, the control unit 14 will deliver a clearance signal, permitting the hoist to be utilized. It further comprises a timer means, which delivers date and time and there is also a from the exterior readable memory, in which time of use and user are stored for each occasion of use. For exchange of signals with the hoist control means 9 an additional interface is provided in the control unit 14. Preferably, the control unit 14 also controls the locking of the hoist doors, which is accomplished by means of a magnetic locking means 10, and comprises outputs suitable for this purpose. Still another interface for activating the control unit 14 is provided for input of suitable

initial information to the control unit 14, such as time and date. The input is carried out by means of a suitable activation means 22. In the control unit 14 is a preferably exchangeable memory unit provided, e. g. in the form of a memory card or disc, which will be read in an evaluation unit, a new, set to zero memory unit being installed in the control unit 14 upon the removal of a full memory unit.

The power supply is independent of the power supply to the hoist and is accomplished by means of a battery, not shown.

The system operates as described below, assuming that the hoist cage 1 is located at a stop level with locked doors:

1. The magnetic card is inserted in to the reader 12, which is accessible from outside at the stop level. The identification code is read and if the user is authorized, a green lamp provided at the reader will be lit at the same time as the locking 10 of the door will be interrupted and a clearance signal will be delivered to the control system of the hoist. The user code will be stored in the memory unit of the control unit 14 at the same time. If the user code does not correspond to any acceptable code, then a red lamp provided at the reader 12 will be lit. This lamp could also be lit when there exists any disturbance in the system, thus indicating that the hoist is out of order.
2. The authorized user then takes his card and opens a hoist cage door. A sensor provided at the hoist cage door then delivers a signal to the control unit, which causes the start time for the use of the hoist to be supplied to and stored in the memory unit of the control unit 14.
3. The hoist cage 1 is loaded and when ready the doors are closed.
4. The hoist cage 1 goes to a desired stop level, chosen via the control board 9.
5. The hoist doors may now be opened and the hoist cage emptied.
6. If the user does not need to use the hoist any longer, he closes the doors and inserts his magnetic card into the reader 12, the control unit 14 then delivering a locking signal to the door locking means 10 and to the control system 9 of the hoist, thereby locking the doors and disabling the control system. Simultaneously, the time will be recorded in the memory unit.

Those skilled in the art realize that the above described control functions could be achieved in many different ways and that the invention is not limited by the described preferred embodiment. Suitably the control unit 14 could be passed over by a mechanical key, e. g. at the maintenance of the hoist or in case of any other disturbance in the system.

At suitable intervals the memory will be read, e. g. by removing a memory card with recorded information

from the control unit 14 and replacing it with another, set to zero memory card, the recorded information in the memory then being prepared and evaluated in an evaluation unit, e. g. a common PC, in order to charge the individual users in accordance with their time of use of the hoist.

#### Claims

1. A passenger hoist or lift, in particular a temporarily erected hoist and more particularly a building hoist, comprising a hoist cage (1) having a control system (9) for the control of the hoist cage (1), **characterized in** that it comprises a locking means (10), having a locking position, wherein use of the hoist is prevented, and a release position, wherein use of the hoist is permitted, an identifying system associated with said locking means (10) for identifying the authorization of a user, which in case of accepted authorization delivers a release signal to the locking means (10), a recording system associated with said identifying system and comprising a memory unit and a timer means, the identity of the user and the start and final time of the use of the hoist or lift provided by said timer at each occasion of use being stored in order to accomplish a debiting based on time of use of said hoist or lift.
2. A hoist or lift in accordance with claim 1, **characterized in** that said locking means (10) is a magnetic lock for locking the doors of said hoist or lift.
3. A hoist or lift in accordance with claim 1 or claim 2, **characterized in** that said identifying system comprises a code reader (12), intended to read a user-identifying code provided on a carrier.
4. A hoist or lift in accordance with claim 3, **characterized in** that said code supporting carrier is a magnetic card and in that said code reader is a slot reader.
5. A hoist or lift in accordance with any of claims 1-4, **characterized in** that said memory unit is an exchangeable memory card, which could be read in an evaluation unit for the compilation of the total hoist or lift time for each of the users.

